Department of Energy
National Nuclear Security Administration
1301 Clay Street
Oakland, California 94612-5208

July 17, 2002

TO: Offerors

SUBJECT: Amendment 003 to Request for Proposals No. DE-RP03-02SF22307 System Integration of a Multi-Mission Radioisotope Thermoelectric Generator (MMRTG)

Amendment 003 to Request for Proposals No. DE-RP03-02SF22307 modifies Attachment I, the Statement of Work. Specifically the Scope and sections 2.9, 3.8, 4.8, 5.8 and 6.0 are revised with the revisions highlighted in bold italics.

Sincerely,

Wayne Bryan

Wayne Bryan
Contracting Officer

Enclosure: Amendment 003

OMB Approval 2700-0042

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE	PAGE	OF	PAGES
	1		2

2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. *(If applicable)*
Amendment 003	See Block 16C	No PR	

6. ISSUED BY — CODE: CAPD

U.S. Department of Energy
Oakland Operations Office
1301 Clay Street
Oakland, CA 94612-5208

7. ADMINISTERED BY *(If other than Item 6)* — CODE:

8. NAME AND ADDRESS OF CONTRACTOR *(No. Street, county, State and ZIP: Code)*

CODE | FACILITY CODE

(✓): X

9A. AMENDMENT OF SOLICITATION NO.: DE-RP03-02SF22307

9B. DATED *(SEE ITEM 11)*: June 13, 2002

10A. MODIFICATION OF CONTRACT/ORDER NO.:

10B. DATED *(SEE ITEM 13)*:

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

☒ The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers ☐ is extended, ☒ is not extended.

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:

(a) By completing Items 8 and 15, and returning one (1) copy of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATA SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and data specified.

12. ACCOUNTING AND APPROPRIATION DATA *(If required)*

13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

(✓)	
	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: *(Specify authority)* THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT/ORDER NO. IN ITEM 10A.
	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES *(such as changes in paying office, appropriation date, etc.)* SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
	D. OTHER: Specify type of modification and authority)

E. IMPORTANT: Contractor ☐ is not, ☐ is required to sign this document and return __copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION *(Organized by UCF section headings, including solicitation/contract subject matter where feasible.)*

Except at provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER *(Type or print)*	16A. NAME AND TITLE OF CONTRACTING OFFICER *(Type or print)*
	Wayne Bryan Contracting Officer

15B. CONTRACTOR/OFFEROR	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA	16C. DATE SIGNED
(Signature of person authorized to sign)		BY Wayne Bryan *(Signature of Contracting Officer)*	7/17/2002

Block 14

The solicitation is amended as follows:

1. Section L, Clause L.078 FAR 52.222-24 PREAWARD ON-SIGHT EQUAL OPPORTUNITY COMPLIANCE REVIEW (APR 1984) is deleted and replaced with the following:

   "L.078 FAR 52.222-24 PREAWARD ON-SIGHT EQUAL OPPORTUNITY COMPLIANCE REVIEW (FEB 1999):

   If a contract in the amount of $10 million or more will result from this solicitation, the prospective Contractor and its known first-tier subcontractors with anticipated subcontracts of $10 million or more shall be subject to a preaward compliance evaluation by the Office of Federal Contract Compliance Programs (OFCCP), unless, within the preceding 24 months, OFCCP has conducted an evaluation and found the prospective Contractor and subcontractors to be in compliance with Executive Order 11246."

2. Attachment I, Statement of Work, is modified by replacing the attached pages, dated 7/10/02, with revisions to the Scope and sections 2.9, 3.8, 4.8, 5.8 and 6.0

End of Amendment 003

SCOPE

The Contractor shall serve as System Integration Contractor for the DOE MMRTG project. The Contractor shall:

- Develop MMRTG Requirements and Specifications and Test Plans for the Engineering, Qualification, and Flight ETGs and MMRTGs.
- Develop qualification and acceptance test levels for the ETGs and MMRTGs.
- Perform structural, thermal, and thermoelectric design analyses of the MMRTG in order to support a definitive design basis in such areas as system response to launch dynamic loads, heat source support preload, thermal interface definition, radiation properties, and handling requirements during and prior to launch.
- Develop power predictions for various mission profiles, including various launch dates and mission durations.
- Develop the design and establish engineering documentation for the MMRTGs and ground support equipment.
- Demonstrate a thermoelectric component manufacturing capability for fabricating thermoelectric materials and thermoelectric components. Provide for the training and qualification of operators, supervisors, and inspectors.
- Qualify the production facility and procedures by manufacturing qualification lots of thermoelectric components and by the fabrication and test of several qualification lots to determine lifetime performance.
- Fabricate, assemble, and test an Engineering ETG to support the design basis for the MMRTG.
- Fabricate, assemble, and test a Qualification ETG and ship to the DOE facility for fueling and testing to qualify the MMRTG.
- Provide technical review and oversight of the ETG/MMRTG handling, fueling, and acceptance testing at the DOE fueling and test facility as defined in Interface Working Agreements (IWAs). The Contractor shall also interface with the various Government heat source production facilities per the IWAs.
- ***Fabricate ground support equipment, as required, for use at the launch site***

and update, as necessary, to meet specific mission requirements.

- Prepare safety assessments of the MMRTG and support analyses and documentation for the NASA NEPA Environmental Impact Statement (EIS) process based upon mission/launch vehicle databooks. Prepare Safety Analysis Reports and
participate in the Interagency Nuclear Safety Review Panel (INSRP) reviews with DOE and NASA to obtain launch approval.

- Prepare a Safety Test Plan and provide test hardware and engineering oversight for safety tests conducted at Government laboratories or elsewhere.

- Provide launch site support for the receipt, storage, maintenance, and flight preparation of MMRTGs; spacecraft integration; support activities; and testing of MMRTGs.

- Participate in special studies as requested by the Office of Space and Defense Power Systems.

- Establish project management, project control and reporting, quality assurance, and environmental and reliability activities required for this contract. National, state, and local safety, health, and environmental laws shall be adhered to in the manufacture of ETGs.

The Contractor shall prepare a Qualification MMRTG Test Report. The Qualification MMRTG Test Report shall be a stand-alone document encompassing the Qualification MMRTG Test Plan, testing history, and test results. The report shall provide objective evidence that the Qualification MMRTG meets the requirements and specifications developed in section 2.2.

2.8 Life-Testing and Performance Model Verification

The Contractor shall continue testing the thermoelectric components that were initiated in Phase I to further determine their lifetime performance as well as to validate lifetime model predictions. The Contractor shall also predict the lifetime performance of the MMRTG. The Contractor shall coordinate with the DOE fueling and test facility to obtain test data from the Qualification MMRTG to validate the model predictions. The Contractor shall issue results of the lifetime model predictions and performance of the thermoelectric components and the MMRTG. The information reported should include, but is not limited to, performance, anomalies, analysis of test results, performance predictions and model validation results.

2.9 Fueling, Transportation and Ground Support Tooling and Equipment

The Contractor shall design and fabricate the tooling and equipment to transport the ETG to the DOE fueling and test facility. The Contractor shall provide specifications for the DOE fueling and test facility to procure and fabricate tooling and equipment for handling, fueling and testing the Qualification and Flight MMRTGs at the DOE fueling and test facility, and for transporting the MMRTGs to the launch site. The Contractor shall design the ground support equipment required to handle, monitor, and transport the MMRTG at the launch site. ***The ground support equipment required for the launch site shall be fabricated during the execution of Phase VI, which may be exercised in concert with the execution of the Phase III, IV, and/or V Options.***

2.10 MMRTG Mass and Thermal Models and a Fueling Mock-up

The Contractor shall design and build a mass model, a thermal model, and a fueling mock-up. The mass model shall be constructed to duplicate the mass and center of gravity of a Flight MMRTG, and shall simulate mechanical interfaces with the spacecraft.

The thermal model shall be constructed to provide a simulation of the thermal properties (e.g., surface temperatures) of a Flight MMRTG. The thermal model shall be electrically heated, capable of generating the thermal output of a Flight MMRTG and dissipating the heat at a temperature that approximates the average external surface temperature of an operating MMRTG in both a Mars planetary and outer space environment. It shall also simulate mechanical interfaces with the spacecraft.

The full-size fueling mock-up shall be sufficiently representative of a Flight MMRTG to

MMRTG Test Report shall be a stand-alone document encompassing the test plan, testing history, and test results. The report shall provide objective evidence that the Flight MMRTG meets the Flight MMRTG Product Specification.

3.7 Life-Testing and Performance Model Verification

The Contractor shall continue monitoring, analyzing, and reporting the results of the thermoelectric component life-testing and Qualification MMRTG life-testing tasks. The Contractor shall issue results of the lifetime model predictions and performance of the thermoelectric components and the MMRTG. The information reported should include, but is not limited to, performance, anomalies, analysis of test results, performance predictions and model validation results.

3.8 Launch Support

The Contractor shall provide ground operations planning support, participate in launch working groups and provide representation at meetings concerning MMRTG needs and characteristics for the purpose of planning for delivery, storage, performance of fit-checks, spacecraft installation, launch and close-out operations. This includes supporting shipping and launch readiness reviews. For planning purposes, the site for the potential Mars 09 mission launch will be KSC/CCAFS. Support shall include providing necessary personnel, attendance at meetings, and home office technical support.

The Contractor shall provide technical support to the DOE fueling and test facility for the monitoring of the Flight MMRTGs at the launch site, as required. ***The Contractor shall update, as necessary, the launch site ground support equipment designed in Phase II.***

3.9 NEPA and Launch Safety

The Contractor shall, in support of the launch approval process for the potential 2009 mission, continue performing safety analyses of the overall response of the MMRTG to accidents that could occur after attachment of the MMRTG to the Mars 09 spacecraft, in the pre-launch period or during the launch through Earth escape. This shall include preparation of final safety analysis reports and participation in the interagency launch approval process.

The Contractor shall continue to support and participate in any NASA NEPA activities that have not been brought to closure. During Phase III, it is anticipated that the focus of the analysis will be in support of the launch approval safety analysis activities. Also during Phase III, the Contractor shall support any databook activities that remain open. The Contractor shall participate in meetings with DOE in development of these analyses.

The Contractor shall issue the Draft Safety Analysis Report (DSAR) and the FSAR for the Mars 09 mission. The Contractor shall support the review of such documentation by the

MMRTG Test Report shall be a stand-alone document encompassing the test plan, testing history, and test results. The report shall provide objective evidence that the Flight MMRTG meets the Flight MMRTG Product Specification.

4.7 Life-Testing and Performance Model Verification

The Contractor shall continue monitoring, analyzing, and reporting the results of the thermoelectric component life-testing and Qualification MMRTG life-testing tasks. The Contractor shall issue results of the lifetime model predictions and performance of the thermoelectric components and the MMRTG. The information reported should include, but is not limited to, performance, anomalies, analysis of test results, performance predictions and model validation results.

4.8 Launch Support

The Contractor shall provide ground operations planning support, participate in launch working groups and provide representation at meetings concerning MMRTG needs and characteristics for the purpose of planning for delivery, storage, performance of fit-checks, spacecraft installation, launch and close-out operations. This includes supporting shipping and launch readiness reviews. For planning purposes, the site for the potential Outer Planet 11 mission launch will be KSC/CCAFS. Support shall include providing necessary personnel, attendance at meetings, and home office technical support.

The Contractor shall provide technical support to the DOE fueling and test facility for the monitoring of the Flight MMRTGs at the launch site, as required. ***The Contractor shall update, as necessary, the launch site ground support equipment designed in Phase II.***

4.9 NEPA and Launch Safety

The Contractor shall, in support of the launch approval process for the potential 2011 mission, continue performing safety analyses of the overall response of the MMRTG to accidents that could occur after attachment of the MMRTG to the Outer Planet 11 spacecraft, in the pre-launch period or during the launch through Earth escape. This shall include preparation of final safety analysis reports and participation in the interagency launch approval process.

The Contractor shall continue to support and participate in any NASA NEPA activities that have not been brought to closure. During Phase IV, it is anticipated that the focus of the analysis will be in support of the launch approval safety analysis activities. Also during Phase IV, the Contractor shall support any databook activities that remain open. The Contractor shall participate in meetings with DOE in development of these analyses.

The Contractor shall issue the DSAR and the FSAR for the Outer Planet 11 mission. The Contractor shall support the review of such documentation by the INSRP and other

MMRTG Test Report shall be a stand-alone document encompassing the test plan, testing history, and test results. The report shall provide objective evidence that the Flight MMRTG meets the Flight MMRTG Product Specification.

5.7 Life-Testing and Performance Model Verification

The Contractor shall continue monitoring, analyzing, and reporting the results of the thermoelectric component life-testing and Qualification MMRTG life-testing tasks. The Contractor shall issue results of the lifetime model predictions and performance of the thermoelectric components and the MMRTG. The information reported should include, but is not limited to, performance, anomalies, analysis of test results, performance predictions and model validation results.

5.8 Launch Support

The Contractor shall provide ground operations planning support, participate in launch facility working groups and provide representation at meetings concerning MMRTG needs and characteristics for the purpose of planning for delivery, storage, performance of fit-checks, spacecraft installation, launch and close-out operations. This includes supporting shipping and launch readiness reviews. For planning purposes, the site for the potential Mars 13 mission launch will be KSC/CCAFS. Support shall include providing necessary personnel, attendance at meetings, and home office technical support.

The Contractor shall provide technical support to the DOE fueling and test facility for the monitoring of the Flight MMRTGs at the launch site, as required. ***The Contractor shall update, as necessary, the launch site ground support equipment designed in Phase II.***

5.9 NEPA and Launch Safety

The Contractor shall, in support of the launch approval process for the potential 2013 mission, continue performing safety analyses of the overall response of the MMRTG to accidents that could occur after attachment of the MMRTG to the Mars 13 spacecraft, in the pre-launch period or during the launch through Earth escape. This shall include preparation of final safety analysis reports and participation in the interagency launch approval process.

The Contractor shall continue to support and participate in any NASA NEPA activities that have not been brought to closure. During Phase V, it is anticipated that the focus of the analysis will be in support of the launch approval safety analysis activities. Also during Phase V, the Contractor shall support any databook activities that remain open. The Contractor shall participate in meetings with DOE in development of these analyses.

The Contractor shall issue the DSAR and the FSAR for the Mars 13 mission. The Contractor shall support the review of such documentation by the INSRP and other

PHASE VI (OPTION)

6.0 SPARE FLIGHT MMRTG

In the Phase VI Option, the Contractor shall fabricate, assemble, and acceptance test a spare Flight ETG. The Contractor shall support the fueling and acceptance testing activities at the DOE fueling and test facility. This phase may be associated with one or more of the mission specific phases (III-V). All terms, conditions, requirements, and specifications governing the contractual efforts of the mission specific Flight MMRTG shall also apply to the spare Flight MMRTG.

In support of this effort and after updating, as necessary, launch site ground support equipment designed in Phase II to meet specific mission requirements, the Contractor shall fabricate ground support equipment required to handle, monitor, and transport four MMRTGs at the launch site.